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Subject: Microbiology Data Validation (Dimock – Week 3)

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Overview

The Week 3 sample batch consists of 40 samples analyzed by Northeastern Environmental Laboratories, Inc., Scranton, PA, for the following parameters:

Parameter	Analytical Method
Total Coliforms (TC)	SM 9222B
Fecal Coliforms (FC)	SM 9222B + SM 9221E
Heterotrophic Bacteria Count (HPC)	SM 9215C

Data quality was reviewed based on the criteria set forth in *Standard Methods for the Examination of Water and Wastewater*, 20th Edition, and the *USEPA Manual for the Certification of Laboratories Analyzing Drinking Water*, 5th Edition, *Chapter 5 – Critical Elements for Microbiology*. Data quality problems are listed below.

Summary

The total coliform and fecal coliform results for all 40 samples contain no data quality problems. There are several data quality issues associated with Week 3 HPC data. The 8-hour HPC holding time for 38 of the 40 samples was exceeded, one field blank was contaminated affecting the HPC results for 6 samples, a media positive control was not performed, and most importantly, method blanks (sterility controls) were not performed with each set of samples plated. The absence of method blanks means the HPC results of all 40 samples cannot be validated. Data qualifications are provided in Table 1 under Conclusions.

Data Quality Issues

1. HPC Holding Times: The 8-hour holding time for HPC was exceeded for 38 of the 40 samples. Those samples exceeding the holding time are highlighted in gray below. Depending on other water quality factors an extended holding time may cause the number of bacteria present to increase, decrease, or remain unchanged. Results therefore may be biased high, low, or not affected.

FB11	HW16P	HW30	HW38P	HW48
FB12	HW16Z	HW30P	HW43	HW48Z
FB13	HW21	HW31	HW43P	HW49
FB14	HW21Z	HW31P	HW44	HW49P
FB15	HW22	HW31Z	HW45	HW51
HW15A	HW22P	HW36N	HW45P	HW51P
HW15A-P	HW23	HW36NP	HW47	HW54
HW16	HW23P	HW38	HW47P	HW54P

2. HPC Field Blanks: One field blank was contaminated. Consequently, the results of the five HPC samples collected and shipped with it cannot be validated. Those samples and the field blank are highlighted in gray below.

FB11	HW16P	HW30	HW38P	HW48
FB12	HW16Z	HW30P	HW43	HW48Z
FB13	HW21	HW31	HW43P	HW49
FB14	HW21Z	HW31P	HW44	HW49P
FB15	HW22	HW31Z	HW45	HW51
HW15A	HW22P	HW36N	HW45P	HW51P
HW15A-P	HW23	HW36NP	HW47	HW54
HW16	HW23P	HW38	HW47P	HW54P

3. HPC Method Blanks: A method blank (or agar sterility control plate) was not performed with each series of samples plated. Consequently, without a clean method blank showing no growth, the HPC results obtained could be due to contamination of a sample during analysis at the bench. The results (of samples in gray) cannot be validated.

FB11	HW16P	HW30	HW38P	HW48
FB12	HW16Z	HW30P	HW43	HW48Z
FB13	HW21	HW31	HW43P	HW49
FB14	HW21Z	HW31P	HW44	HW49P
FB15	HW22	HW31Z	HW45	HW51
HW15A	HW22P	HW36N	HW45P	HW51P
HW15A-P	HW23	HW36NP	HW47	HW54
HW16	HW23P	HW38	HW47P	HW54P

4. HPC Agar Positive Control: No agar batch positive controls results were provided in the QC data package. Results for all samples (highlighted below in gray) are affected and may be biased low, especially results indicating <1 CFU/mL.

FB11	HW16P	HW30	HW38P	HW48
FB12	HW16Z	HW30P	HW43	HW48Z
FB13	HW21	HW31	HW43P	HW49
FB14	HW21Z	HW31P	HW44	HW49P
FB15	HW22	HW31Z	HW45	HW51
HW15A	HW22P	HW36N	HW45P	HW51P
HW15A-P	HW23	HW36NP	HW47	HW54
HW16	HW23P	HW38	HW47P	HW54P

Conclusions

Table 1. below presents the final data qualifications for Week 3 samples where they apply. The number in parentheses corresponds to the data quality issue discussed above. (The numbers are not related to issues listed in other data validation reports.)

Table 1. Data Qualifiers -- Week 3

SAMPLE	QUALIFIERS for TC/FC DATA	QUALIFIERS for HPC DATA
FB11		R (3)
FB12		R (3)
FB13		R (3)
FB14		R (3)
FB15		R (3)
HW15A		R (3)
HW15A-P		R (3)
HW16		R (3)
HW16P		R (3)
HW16Z		R (3)
HW21		R (3)
HW21Z		R (3)
HW22		R (3)
HW22P		R (3)
HW23		R (3)
HW23P		R (3)
HW30		R (3)
HW30P		R (3)
HW31		R (3)
HW31P		R (3)
HW31Z		R (3)
HW36N		R (3)
HW36N-P		R (3)
HW38		R (3)
HW38P		R (3)
HW43		R (3)
HW43P		R (3)
HW45		R (3)
HW345P		R (3)
HW47		R (3)
HW47P		R (3)
HW48		R (3)
HW48Z		R (3)
HW49		R (3)
HW49P		R (3)
HW51		R (3)
HW51P		R (3)
HW54		R (3)
HW54P		R (3)